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CHRIS H. POINDEXTER
VICE PRESIDENT
ENGINEERING AND CONSTRUCTION

April 14, 1983

Mr. William J. Dircks
Executive Director for Operations
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Subject: Unresolved Safety Issue A-47
Safety Implications of Control Systems

Reference: Letter from Mr. K. R. Goller (NRC) to
Mr. A. E. Lundvall, Jr., (BG&E) dated 3/8/83,
same subject.

Dear Mr. Dircks:

We have received the referenced letter from the Division of Facility Operations suggesting that meetings be arranged to facilitate the transfer of information necessary for you to commence your analysis of the Calvert Cliffs design as part of the NRC program for the resolution of the subject unresolved safety issue. As recalled in the letter, we agreed to reevaluate the availability of engineering resources for this USI at the conclusion of the (then ongoing) Unit 2 refueling outage at Calvert Cliffs and to advise you of any changes in our position with regard to participation in the A-47 program.

At our meeting of February 2, 1983, we informed you that we cannot participate in the A-47 program because those of our personnel who have appropriate expertise are fully involved in other important activities. At that time, we also expressed our reservations about the structure of the NRC Task Action Plan and its suitability for resolving the USI. Inasmuch as Calvert Cliffs would remain a subject of the A-47 study regardless of our ability to participate, and because of these concerns, you solicited our suggestions on how such a project might better be undertaken.

On April 13 our Messrs. Lundvall and Olson met with NRC staff members V. Stello, E. Case, D. Ross, and F. Schroeder to discuss our recommendations for improving the A-47 program. The approach that we outlined during this meeting was favorably received by these staff members and involves the use of the Calvert Cliffs plant-specific simulator. The purpose of this letter is to confirm our proposal and to describe its merits in further detail. We believe that our approach would significantly improve the quality of the A-47 program while minimizing the adverse impact on our engineering resources.

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Our review of the A-47 task action plan and our subsequent discussions with your contractor raised several concerns. Most importantly, the existing A-47 program requires a significant level of technical involvement by our engineering staff to ensure that data, from whatever source, is used appropriately. Without such a commitment on our part, there is not sufficient assurance that the control systems models constructed by your contractor will accurately reflect the Calvert Cliffs design. In view of simplifications which may be required to model the Calvert Cliffs plant on the (somewhat limited) hardware available at Oak Ridge, this cooperation is even more vital. It is clear from our conversations with your staff and your contractors that they may have underestimated the magnitude and expense of this effort if it is to be completed in a useful fashion.

The existing task action plan does not provide a clearly defined basis for selecting transients or associated precursory events to be modeled. The task action plan makes frequent reference to the accidents analyzed in the FSAR, and emphasizes your desire to evaluate failures leading to transients that may be outside the scope of our FSAR, e.g., overfilling of the steam generator. Although such events are pertinent to the A-47 research program, we feel that this set of transients is too loosely defined to be clearly understood or thoroughly and consistently evaluated. Development of a reasonable methodology by which the analyst can select transients to be modeled may be a more important part of this program than the modeling of plant systems, yet it has received little attention by comparison.

We are also concerned about the treatment of analysis results. Prediction of severe consequences may arise from modeling conditions outside the design basis of Calvert Cliffs. If the application of such modeling conditions is not carefully controlled, the results of the A-47 program, when published, may unnecessarily cast the Calvert Cliffs design in an unfavorable light.

We propose that, instead of modeling our plant at ORNL, the new Calvert Cliffs plant simulator be used to evaluate plant response. This new simulator, currently in the latter stages of construction at Combustion Engineering, represents the state-of-the-art in computer simulation.

Generally speaking, today's digital computer-based simulators do not actually model the overall plant or system-specific responses; rather, they simply call up preprogrammed responses (manifested as control room instrument indications) to predetermined transients. The new Calvert Cliffs simulator will actually calculate the plant response from first principles, using software developed from several different Combustion Engineering thermal-hydraulics and core performance codes. The Calvert Cliffs simulator employs four large, fast, modern computers operating in parallel to model plant performance. Consequently, the raw computing power of our simulator is superior by orders of magnitude to that of the machine that is currently being employed by ORNL for the A-47 program. These models have been built by C-E over the past two years using plant system information similar to that which you have requested. Combustion Engineering's familiarity with Calvert Cliffs and experience with thermal-hydraulics codes, coupled with the capability of the new computers, ensures that our simulator models the as-built design of Calvert Cliffs far better than any other model which could be developed within a reasonable time frame. Since the delivery date for

to complete its Calvert Cliffs model (assuming they began this month), essentially no extension in the A-47 schedule need result from accepting our proposal; indeed, we expect that adoption of our proposal may expedite your program. As our personnel have been intimately involved in the development of the simulator over a period of approximately two years, we would be reasonably assured of the accuracy of the A-47 products without placing an unreasonable burden on our engineering staff.

The advantages of the arrangement described above are substantial. The quality of the A-47 products would be greatly improved with little risk to the NRC's current completion schedule. Moreover, our proposal would permit reallocation of NRC resources from model development to the more important issue of transient initiator selection.

We are certain that you are sensitive to the fact that the burden of assisting in NRC research programs has not fallen equally on all licensees. To be sure, there are benefits which accrue to the licensee, however, we cannot afford the luxury of supporting every program that comes along. Just as the imposition of too many hardware safety improvements too quickly may become a safety concern in and of itself, diversion of a larger and larger fraction of our engineering talent to research interferes with our ability to complete other important engineering tasks.

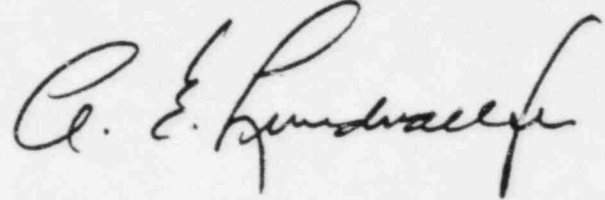
We suggest that it would be prudent and efficient to bring Combustion Engineering into this program as a subcontractor to operate the simulator, perform any additional modeling which may be required specifically for A-47, and to provide additional technical support. In this way, the research staff and its contractors would have direct access to the simulator and NSSS designers as well as to the model development team. We believe that the quality and credibility of the A-47 program would be significantly improved by such cooperation, which would at the same time significantly reduce the burden of participation to us, in terms of both engineering talent and dollars.

As you are no doubt aware, we are participating in a number of other studies to evaluate and improve the safety and reliability of the Calvert Cliffs plant. Two of these studies may produce results that will be of benefit to the A-47 program. The NRC (USI A-49) Pressurized Thermal Shock Study will provide a better understanding of those specific transients that could challenge reactor vessel integrity. The Department of Energy-sponsored "Integrated Approach to Economical, Reliable, Safe Nuclear Power Production" Study will provide insight to the importance of systems and a possible methodology for screening those transients of safety significance. Since a clear basis for this selection process is needed, consideration should be given to adjusting the A-47 schedule to allow the integration of these other study products. If our current rate of progress on these studies is any indication, such adjustments need not be major.

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In conclusion, since an appropriate level of participation in the A-47 study as currently planned remains impossible for us, we offer this alternative as a means to satisfying the objectives of the USI. We propose a meeting between Baltimore Gas and Electric, Combustion Engineering, ORNL, and NRC personnel to discuss this approach in greater detail. It is suggested that this meeting be held at Combustion Engineering offices in Windsor, Connecticut during the week of May 23, 1983.

Very truly yours,



CHP/BSM/pdy

cc: Dr. W. Kerr - ACRS

Messrs. H. R. Denton - NRC
R. B. Minogue - NRC
K. R. Goller - NRC
D. G. Eisenhut - NRC
T. P. Speis - NRC
D. H. Jaffe - NRC
R. E. Architzel - NRC
F. Stern - CE
A. Millunzi - DOE